What is SARE?

Since 1988, the Sustainable Agriculture Research & Education (SARE) program has been the go-to USDA grants and outreach program for farmers, ranchers, researchers and educators who want to develop innovations that improve farm profitability, protect water and land, and revitalize communities. To date, SARE has awarded over $389 million to more than 8,542 initiatives.

SARE is grassroots with far-reaching impact

Four regional councils of expert practitioners set priorities and make grants in every state and island protectorate.

SARE communicates results

SARE shares project results by requiring grantees to conduct outreach and grower engagement; and by maintaining an online library of practical publications, granteeproduced information products and other educational materials.

SARE: Advancing the Frontier of Sustainable Agriculture in...

South Carolina

Project Highlight: Fruit Bagging Reduce Reliances on Pesticides

When Clemson University fruit specialist Juan Carlos Melgar suggested putting a paper bag over a peach to detract insects and diseases during production, farmers laughed. But when his SARE-funded trials showed that the technique protects the fruit from devastating brown rot, marauding insects like plum curculio and even hungry birds, producers and backyard growers started paying attention.

Researchers found that bagging peaches between petal fall and harvest reduces pesticide use while increasing yields and maintaining flavor. Even though it involves more labor, Melgar estimated that bagging can increase revenue by $95 per tree in an organic system when the fruit is sold directly to consumers. “We’ve gotten a lot of positive responses from farmers all over the country as a result of the research study,” said Melgar.

Fruit bagging for protection is a common strategy in Asia. With South Carolina ranked second in the nation behind California in peach production at 77,000 tons, researchers at Clemson felt that applying the technique to orchards was a worthwhile endeavor because peach growers in the southeastern U.S. face very high pest and disease pressures. Melgar is taking this research to a regional level with a newly acquired $1 million USDA-NIFA grant, applying the technique to more orchards in South Carolina, Georgia and Florida.

For more information on this project, see sare.org/projects, and search for project number OS16-094.

SARE in South Carolina

southern.sare.org/sare-in-your-state/south-carolina

$5,120,426 in total funding

82 grant projects

(since 1988)

For a complete list of grant projects state by state, go to www.sare.org/state-summaries
SARE Grants in South Carolina

Total awards: 82 grants
19 Research and Education
6 Sustainable Community Innovation
13 Professional Development Program
21 Farmer/Rancher
10 Graduate Student
10 On Farm Research/Partnership
3 Education Only

Total funding: $5,120,426

$3,670,122 Research and Education
$43,620 Sustainable Community Innovation
$799,675 Professional Development Program
$197,885 Farmer/Rancher
$131,247 Graduate Student
$142,377 On Farm Research/Partnership
$135,500 Education Only

Find a complete list of projects on page 3.

SARE's Impact

53 percent of producers report using a new production technique after reading a SARE publication.

79 percent of producers said they improved soil quality through their SARE project.

64 percent of producers said their SARE project helped them achieve higher sales.

Learn about local impacts at: southern.sare.org/sare-in-your-state/south-carolina

Contact Your SARE State Coordinator

SARE sustainable ag coordinators run state-level educational programs for Extension and other ag professionals, and many help grant applicants and recipients with planning and outreach. Visit southern.sare.org/state-pages/south-carolina to learn more.

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Clemson University
(864) 656-4080
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jidassi@scsu.edu

SARE is funded by the USDA’s National Institute of Food and Agriculture (NIFA).

This report includes summaries of competitive grant programs only. Some competitive grant programs that are no longer offered may be included or excluded from the totals in this report depending on the grant program and SARE region.
South Carolina has been awarded $5,120,426 grants to support 78 projects, including but not limited to, 15 research and/or education projects, 13 professional development projects and 21 producer-led projects. South Carolina has also received additional SARE support through multi-state projects.

### RESEARCH AND EDUCATION GRANTS

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<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
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<tbody>
<tr>
<td>LS23-379</td>
<td>Flipping the cages on sustainable aquaculture: a study on oyster aquaculture technique and policy to reduce pathogens</td>
<td>$358,557</td>
<td>Sarah Pedigo&lt;br&gt;South Carolina Sea Grant Consortium&lt;br&gt;Matthew Gorstein&lt;br&gt;South Carolina Sea Grant Consortium&lt;br&gt;Dr. Peter Kingsley-Smith&lt;br&gt;South Carolina Department of Natural Resources Marine Resources&lt;br&gt;Mike Marshall&lt;br&gt;South Carolina Department of Health and Environmental Control&lt;br&gt;Dr. Matthew Nowlin&lt;br&gt;College of Charleston</td>
</tr>
<tr>
<td>LS22-374</td>
<td>Cover crop inter-seeding in organic corn production to reduce resource inputs and soil disturbance and enhance pest control and farm profitability</td>
<td>$371,000</td>
<td>Dr. Sruthi Narayanan&lt;br&gt;Clemson University&lt;br&gt;Dr. Carmen Blubaugh&lt;br&gt;University of Illinois&lt;br&gt;Dr. Joshua Idassi&lt;br&gt;South Carolina State University&lt;br&gt;Dr. Dave Lamie&lt;br&gt;Clemson University&lt;br&gt;Dr. Meghnaa Tallapragada&lt;br&gt;Temple University&lt;br&gt;Dr. Rongzhong Ye&lt;br&gt;Clemson University</td>
</tr>
<tr>
<td>LS22-369</td>
<td>Establishing an Organic Watermelon Industry in South Carolina</td>
<td>$369,999</td>
<td>Matthew Cutulle&lt;br&gt;Clemson University, CREC&lt;br&gt;Dr. Bhupinder Farmaha&lt;br&gt;Clemson University&lt;br&gt;Dr. Shaker Kousik&lt;br&gt;USDA-ARS-United States Vegetable Lab&lt;br&gt;Dr. Amnon Levi&lt;br&gt;USDA-ARS-United States Vegetable Lab&lt;br&gt;Brian Ward</td>
</tr>
<tr>
<td>LS22-366</td>
<td>Development of Sustainable Strategies for Managing Bacterial Diseases and Improving Tree Health in the Peach Production System</td>
<td>$371,000</td>
<td>Hehe Wang&lt;br&gt;Clemson University&lt;br&gt;Juan Carlos Melgar&lt;br&gt;Clemson University&lt;br&gt;Guido Schnabel&lt;br&gt;Clemson University&lt;br&gt;Dr. Michael Vassalos&lt;br&gt;Clemson University&lt;br&gt;Dr. Rongzhong Ye&lt;br&gt;Clemson University</td>
</tr>
<tr>
<td>LS21-355</td>
<td>Gullah/Geechee Agro-Culture: Sustaining Culture to Sustain Agriculture in the Lowcountry</td>
<td>$341,346</td>
<td>Dr. Najmah Thomas&lt;br&gt;University of South Carolina Beaufort</td>
</tr>
</tbody>
</table>
Strengthening Farmer-consumer Connections for Sustainable Agricultural Systems $213,954
Courtney Quinn
Furman University
Dr. Karen Allen
Furman University
Dr. John Quinn
Furman University

Utility of Anaerobic Soil Disinfestation and Organic Herbicides for Weed and Disease Management in Organic Solanaceous Vegetable Systems $293,470
Matthew Cutulle
Clemson University, CREC

Incorporating Natural, Non-toxic Arthropod Resistant Tomato Varieties into Southern Production Systems $299,963
Juang-Horng Chong
Clemson University

Improving Silvopasture Systems in the South: Identification of Suitable Forage Crops and Enhancement of Environmental Quality in Upland Forests $135,487
Dr. John Quinn
Furman University

Improvement of the safety of food handling practices on small farms $200,000
Dr. Paul Dawson
Clemson University

Expanding the grazing season for sustainable year-round forage-finished beef production $163,000
Susan Duckett
Clemson University

Development and Integration of Sustainable Agriculture Core Curriculum Training into the Southern Region Extension Education System $241,000
Dr. Geoff Zehnder
Clemson University

Suppression of weeds and other pests in fresh market vegetables using wild radish cover crop $173,125
Jason Norsworthy
Clemson University

Creating a value chain system for local and regional farm products $19,310
Dr. Geoff Zehnder
Clemson University

Evaluation of Low-Input, No-Till, No-Herbicide Continuous Grazing System for Dairy Cows $118,911
Jean Bertrand
Clemson University

PROFESSIONAL DEVELOPMENT PROGRAM GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
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<th>Project Leaders</th>
</tr>
</thead>
</table>
| SPDP23-021      | Indigo and Companion Food Crops: Opportunities for Limited Resource Farmers in the Lowcountry of South Carolina and Georgia | $79,500      | Donna Hardy
ICIC                                                |
| SPDP22-15       | Training Educators in the Southern Region Using Aquaponics as a Sustainable Agriculture Solution | $71,322      | Dr. Lance Beecher
Clemson University
Ben Calhoun
Greenwood Area SBDC
Roland McReynolds
Carolina Farm Stewardship Association |
<table>
<thead>
<tr>
<th>Project #</th>
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<th>Project Leaders</th>
</tr>
</thead>
</table>
| SPDP21-01 | Train the Trainers: Reducing impacts from harmful algal blooms in livestock water sources in South Carolina | $79,975      | Dr. Debabrata Sahoo  
Clemson University  
Dr. Matthew Burns  
Clemson University  
Mark Nettles  
South Carolina State University, 1890 Research and Extension  
Heather Nix  
Clemson University Cooperative Extension  
Dr. Michael Vassalos  
Clemson University  
Sarah White  
Clemson University |
| ES19-150  | Advanced Soil Health Training for South Carolina Agriculture Professionals    | $79,847      | Kelly Flynn  
Clemson University |
| ES17-137  | Wholesale Success: Building the capacity of farmers to meet demand for locally and sustainably grown produce | $78,008      | Dr. Geoff Zehnder  
Clemson University |
| ES13-117  | Training in Renewable Energy Systems for Small Farms to Reduce Energy Costs and Improve Profitability | $78,128      | Dr. Geoff Zehnder  
Clemson University |
| ES11-108  | Pollinator Conservation Short Course                                          | $92,066      | Eric Mader  
The Xerces Society |
| ES10-106  | On-Farm Training in Organic Pest Management Practices for Small, Diversified Farms | $83,775      | Dr. Geoff Zehnder  
Clemson University |
| ES02-064  | Calhoun Fields Laboratory: A Program for Experiential Training in Organic Farming Systems | $49,926      | Dr. Geoff Zehnder  
Clemson University |
| ES01-057  | South Carolina Farm and Forest Land Conservation Training                      | $25,428      | Ben Boozer  
Clemson Institute for Economic & Community Develop |
| ES97-017  | Overcoming Training Obstacles: A Realistic Cost-Effective Approach            | $10,000      | Charles Q. Artis  
South Carolina State University, Community and Economic Development |
| ES97-018  | The First Requirement of Agriculture Sustainability: Efficient Management of Available Resources | $60,000      | Charles Q. Artis  
South Carolina State University, Community and Economic Development |
| LST94-006 | Extending Sustainable Agriculture Concepts and Practices to Traditional Agricultural Advisors | $11,700      | Jim Palmer  
Clemson |

**FARMLAND/RANCHER GRANTS**

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
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</thead>
</table>
| FS23-350  | The Effectiveness in Attracting Oyster Spat on PVC versus Bamboo Stakes for Reef Restoration in the North Edisto River | $15,000      | Alison Pierce  
Barrier Island Oyster Co. |
| FS22-341  | Does reduction of nitrate inputs in pasture land treated with Chlorella vulgaris result in cost savings and healthier soil and grass? | $10,975      | Dale Snyder  
Sweetgrass Garden Co-op |
| FS21-330  | Does Treatment with Chlorella vulgaris Extend the Life of Tomato Plants to Increase Tomato Sales? | $14,640      | Dale Snyder  
Sweetgrass Garden Co-op |
FS20-326  Summer Cover Crops for Organic No-till broccoli  $14,820  Sarah Belk  
Wild Hope Farm

FS18-309  Studying the Use of Copper to Raise Healthier Goats  $10,000  Judy Langley  
Judy Langley

FS17-300  Scaling Indigo Production in South Carolina  $5,965  Kathy McCullough  
Farmer

FS16-288  Modified Method for Roller-Crimper No Till System in the Southeast Coastal Plain  $8,327  Mary Connor  
Three Sisters Farm

FS14-284  Is freshwater fish compost as effective as saltwater fish compost on vegetable production?  $10,000  Dale Snyder  
Sweetgrass Garden Co-op

FS13-276  Shade cloth for fall bearing blackberry druplet abortion/malfunction problems in southeastern USA  $6,458  Walker Miller  
The Happy Berry Bunch

FS11-257  Is Fish Waste Compost worth the Mess and Effort?  $9,848  Dale Snyder  
Sweetgrass Garden Co-op

FS11-255  Cucumber Pollination with Bumblebees  $8,530  David MacFawn  
Rawl Farms

FS10-247  Using Buckwheat to Attract Beneficial Insects for Crop Protection  $9,037  Daniel Parson  
Parson Produce

FS10-245  Forage Chicory Use in Rotational Grazing of Sheep to Reduce Intestinal Worms, Reduce Grain Supplementation, And Maximize Growth  $9,078  Kathy McCaskill  
Old McCaskill's Farm

FS09-233  Dual Season Organic Asparagus Production  $9,995  Mary Connor  
Three Sisters Farm

FS04-184  Edamame Variety Trials for the Local Fresh Market  $4,777  Carolyn A. Prince

FS99-102  Cattle Lane Construction Alternatives That Enhance Intensive Grazing Systems  $9,850  Tom Trantham  
Trantham's Dairy Farm

FS98-070  Red Plastic Mulch as an Alternative to Insecticides in Production of Seedless Watermelons  $7,390  John Frazier

FS98-079  Demonstration of a Low-Input Diversified Small Farm Operation  $9,200  Theodore Nesmith

FS95-033  Cover Crops in Integrated Vegetable Production Systems  $9,285  Charles Wingard  
W.P. Rawl & Sons Farms

FS94-005  Vegetable Marketing Strategies for a Small Farm Co-op  $10,000  Curtis Inabinett  
Sea Island Farmers Co-op

FS94-016  Clover Cover Crops, Weed Management and Consumer Tolerance to Insect Damage  $4,710  Horace & Shaw Skipper  
The Berry Patch
## GRADUATE STUDENT GRANTS

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<th>Project Leaders</th>
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</thead>
<tbody>
<tr>
<td>GS23-283</td>
<td>Potential of Cover Crop Influence on Water Repellency and the Sustainability of Southern U.S. Soils</td>
<td>$12,042</td>
<td>Dr. Dara Park, Clemson University, Payton Davis, Clemson University</td>
</tr>
<tr>
<td>GS23-274</td>
<td>Enhancing the Biological Control of the Diamondback Moth (Plutella xylostella) Through Habitat Management for Sustainable Brassica Production</td>
<td>$12,341</td>
<td>Dr. Tom Bilbo, Clemson University, Amna Ghani, Clemson University</td>
</tr>
<tr>
<td>GS22-259</td>
<td>PRECISION: leveraging deepPREinforCement learning algorithm for Sustainable Irrigation scheduling</td>
<td>$16,500</td>
<td>Dr. Vidya Samadi, Clemson University, Lisa Umutoni, Clemson University</td>
</tr>
<tr>
<td>GS22-263</td>
<td>Development and Phenotypic Evaluation of a Brassica oleracea Leafy Greens Diversity Panel</td>
<td>$16,500</td>
<td>Dr. Sandra Branham, Clemson University, Khushwinder Kaur, Clemson University</td>
</tr>
<tr>
<td>GS18-192</td>
<td>Cover Cropping to Improve Soil Moisture Content for the Following Cash Crop</td>
<td>$16,496</td>
<td>Dr. Sruthi Narayanan, Clemson University, Ricardo St. Aime, Clemson University</td>
</tr>
<tr>
<td>GS17-174</td>
<td>Optimizing Nutritional Management in Fruit Tree Production in Southern U.S.</td>
<td>$16,441</td>
<td>Juan Carlos Melgar, Clemson University, Qi Zhou, Clemson University</td>
</tr>
<tr>
<td>GS13-126</td>
<td>Weeds, Nitrogen, and Yield: Measuring the Effectiveness of an Organic No-Till System</td>
<td>$10,927</td>
<td>Dr. Geoff Zehnder, Clemson University, David Robb, Clemson University</td>
</tr>
<tr>
<td>GS04-034</td>
<td>Control of Soilborne Fungi with Biofumigation</td>
<td>$10,000</td>
<td>Anthony Keinath, Clemson University, Samuel Njoroge, Clemson University</td>
</tr>
<tr>
<td>GS04-041</td>
<td>Preliminary Investigation for Application of Supercritical Fluid Extraction Technology for Garlic Oil Extraction</td>
<td>$10,000</td>
<td>Dr. Terry Walker, Clemson University, Meidui Dong, Clemson University</td>
</tr>
<tr>
<td>GS03-020</td>
<td>The Assessment of Conservation and Traditional Tillage Systems on Weed Dynamics, Insect Abundance, and Northern Bobwhite Quail Life and Behavioral Patterns</td>
<td>$10,000</td>
<td>William Bowerman, Clemson University, Derek Eggert, Clemson University</td>
</tr>
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## ON FARM RESEARCH/PARTNERSHIP GRANTS

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<tbody>
<tr>
<td>OS20-133</td>
<td>The Potential of Inter-seeded Cover Crops for Enhancing Soil Health and Soil Moisture Content in a Row Crop Production System</td>
<td>$20,000</td>
<td>Dr. Sruthi Narayanan, Clemson University</td>
</tr>
<tr>
<td>OS18-118</td>
<td>Cover Cropping to Increase the Sustainability of Cropping Systems by Developing Soil Organic Matter, Improving Soil Health, and Suppressing Weed Growth</td>
<td>$15,000</td>
<td>Dr. Sruthi Narayanan, Clemson University</td>
</tr>
<tr>
<td>OS17-109</td>
<td>Identification of Factors Involved in Peach Skin Streaking</td>
<td>$15,000</td>
<td>Guido Schnabel, Clemson University</td>
</tr>
</tbody>
</table>
OS16-093 Increasing Sustainability of Peanut, Cotton, and Soybean Production Systems Through Innovative Interseeding Technology to Enhance Farm Profit and Reduce Pest Occurrence $14,990 Daniel Anco Clemson University

OS16-100 Getting to the Bottom of ‘Bronzing’, A Peach Skin Disorder Causing Severe Losses for Organic and Conventional Peach Growers $15,000 Guido Schnabel Clemson University

OS16-096 Cover Crop Influence on Stored Soil Water Availability to Subsequent Crops $14,995 Dr.Sruthi Narayanan Clemson University

OS16-094 Fruit Bagging as a Strategy to Reduce Reliance on Pesticides for the Production of Peaches in the Southeast $14,967 Juan Carlos Melgar Clemson University

OS07-035 On-Farm Use of a Hybrid Vetch Cover Crop to Reduce Fusarium Wilt in Seedless Watermelon $9,900 Anthony Keinath Clemson University

OS03-010 Poultry Litter Research Project $12,600 David Gunter Clemson Extension Service

OS03-013 Growing Organic Fruits and Vegetables for Local Farmer’s Markets $9,925 York Glover

SUSTAINABLE COMMUNITY INNOVATION GRANTS

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<tbody>
<tr>
<td>CS12-087</td>
<td>Fighting Obesity in Schools By Changing Eating Habits of Students</td>
<td>$10,000</td>
<td>Robert Behr Ashley Ridge High School</td>
</tr>
<tr>
<td>CS10-078</td>
<td>GrowFood Carolina</td>
<td>$10,000</td>
<td>Lisa Turansky South Carolina Coastal Conservation League</td>
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<tr>
<td>CS08-064</td>
<td>Growing the Manning Farmer’s Market</td>
<td>$5,050</td>
<td>Rebecca Rhodes City of Manning</td>
</tr>
<tr>
<td>CS08-065</td>
<td>Marshview Community Organic Farms – Young Farmers of the Lowcountry</td>
<td>$9,700</td>
<td>Sara Reynolds Marshview Comunity Organic Farm</td>
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<tr>
<td>CS07-058</td>
<td>Farmers Market Support Activities</td>
<td>$2,570</td>
<td>Grady Sampson</td>
</tr>
<tr>
<td>CS07-059</td>
<td>Chicora Farmers Market</td>
<td>$6,300</td>
<td>Amanda Crump Metanoia CDC</td>
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EDUCATION ONLY GRANTS

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<tbody>
<tr>
<td>EDS23-054</td>
<td>Gullah/Geechee Heir Property Initiative: Sustaining Heir Property in the Lowcountry Through Sustainable Agriculture</td>
<td>$40,000</td>
<td>Willie Turral Gullah Geechee Initiative Foundation</td>
</tr>
<tr>
<td>EDS23-047</td>
<td>Young Tree Farmers Camp</td>
<td>$46,000</td>
<td>Dr.Jennie Stephens Center for Heirs’ Property Preservation Steve Patterson Center for Heirs’ Property Preservation</td>
</tr>
</tbody>
</table>
Wholesale Market Success For Limited Resource Gullah Farmers

Total funding from the USDA SARE program to South Carolina
$5,120,426

For further information on projects, contact 770-412-4787 or ssare@uga.edu. Sustainable Agriculture Research and Education (SARE) is funded by USDA’s National Institute of Food and Agriculture (NIFA).